

PATENT ABSTRACTS OF JAPAN

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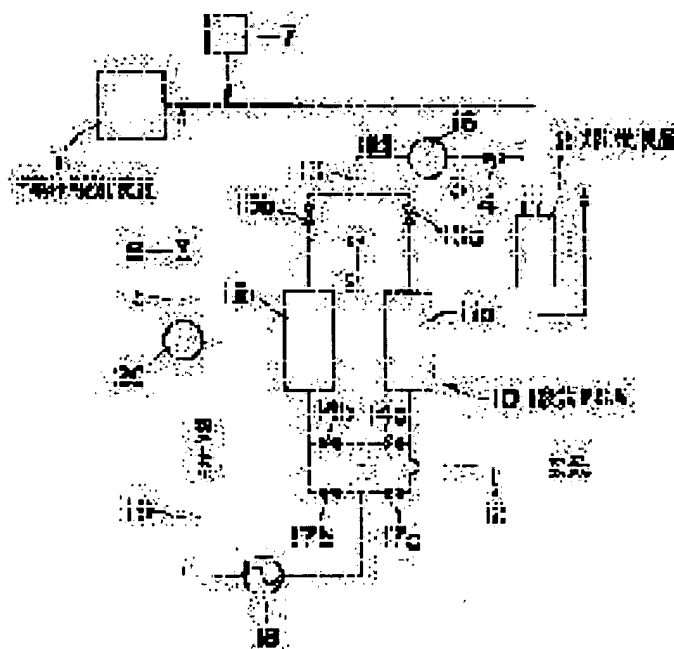
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(54) METHOD AND APPARATUS FOR BURNING AND REMOVING EXHAUST GAS

(57)Abstract:

PURPOSE: To efficiently burn and remove exhaust gas with low cost by obtaining diluting nitrogen and combustion oxygen from a pressure variable type adsorption separator (PSA).

CONSTITUTION: When exhaust gas containing flammable harmful gas to be discharged from a semiconductor manufacturing apparatus 1 is burned by a burner 2, as means for obtaining burning oxygen and diluting nitrogen, oxygen PSA 10 is, for example, used. The PSA 10 continuously manufacture product oxygen by alternately switching a plurality of absorption cylinders 11a, 11b to an absorbing step and a regenerating step, absorbs nitrogen of material air to be introduced from a material gas introducing tube 12 to absorbent such as zeolite, etc., to be separated into nitrogen and oxygen, the separated oxygen is guided to a product oxygen guiding tube 13 to use burning oxygen. Thus, exhaust gas can be efficiently burned and removed with low cost.



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CLAIMS

[Claim(s)]

[Claim 1]In a combustion damage elimination method of exhaust gas which introduces into a burner exhaust gas containing an inflammable detrimental constituent discharged from a semiconductor manufacturing device, and carries out combustion treatment, An exhaust gas combustion damage elimination method introducing into an exhaust gas discharge part of said semiconductor manufacturing device nitrogen separated with this decollator while introducing into said burner oxygen separated with the pressure fluctuation type adsorption separation device which separates oxygen and nitrogen in the air.

[Claim 2]A combustion eliminating unit of exhaust gas which introduces into a burner exhaust gas containing an inflammable detrimental constituent discharged from a semiconductor manufacturing device, and carries out combustion treatment characterized by comprising the following.

A lead pipe which introduces into said burner oxygen separated with this decollator while forming a pressure fluctuation type adsorption separation device which separates oxygen and nitrogen in the air.

A lead pipe which introduces into an exhaust gas discharge part of said semiconductor manufacturing device nitrogen separated with this decollator.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention relates to the method and device which inflammable detrimental constituents, such as Silang and an arsine, are burned and are detoxicated.

[0002]

[Description of the Prior Art]For example, into the exhaust gas discharged from a semiconductor manufacturing device, since Silang, the arsine, and other inflammable detrimental constituents which are semiconductor material gas are contained, from the former, this exhaust gas is introduced into a burner, and is burned, and detoxicating is performed (refer to JP,62-134414,A).

[0003]Recently, although the conventional burner fits combustion of the exhaust gas containing an inflammable high-concentration detrimental constituent, in order to prevent combustion within piping from a semiconductor manufacturing device to a burner, it introduces nitrogen in this piping and makes concentration of the inflammable detrimental constituent the low concentration below a stable combustion zone. For this reason, in the conventional burner, since combustion becomes insufficient, oxygen is added to the air introduced into a burner, or the burner which replaced with air and raised flammability using oxygen is proposed.

[0004]

[Problem(s) to be Solved by the Invention]However, in the device concerning said proposal, oxygen for the above-mentioned combustion and nitrogen for dilution had to be arranged separately, and it was not economical.

[0005]Then, this invention can obtain easily oxygen for the above-mentioned combustion, and nitrogen for dilution, and an object of this invention is to provide the exhaust gas combustion damage elimination method and device which can perform efficient operation.

[0006]

[Means for Solving the Problem]In order to attain the above-mentioned purpose, this invention oxygen for the above-mentioned combustion, and nitrogen for dilution, It is a thing obtaining with the pressure fluctuation type adsorption separation device (henceforth PSA) which separates oxygen and nitrogen in the air, For example, in PSA using adsorbent which adsorbs nitrogen, In PSA using adsorbent which uses nitrogen desorbed from adsorbent as nitrogen for

dilution, using oxygen which passed adsorbent as oxygen for combustion, and adsorbs oxygen, Oxygen desorbed from adsorbent is used as oxygen for combustion, using nitrogen which passed adsorbent as nitrogen for dilution.

[0007]

[work --] for According to the above-mentioned composition, oxygen for combustion and nitrogen for dilution can be easily obtained only by adding PSA to an exhaust gas combustion eliminating unit.

[0008]

[Example] Hereafter, this invention is explained still in detail based on one example shown in a drawing.

[0009] In the combustion eliminating unit which drawing 1 introduces into the burner 2 the exhaust gas containing the inflammable detrimental constituent discharged from the semiconductor manufacturing device 1, and carries out combustion treatment, As a means for obtaining oxygen for said combustion, and nitrogen for dilution, the example which uses oxygen PSA10 using the adsorbent which adsorbs nitrogen is shown in adsorbent.

[0010] The above-mentioned oxygen PSA10 is what switches two or more adsorption columns 11a and 11b to an adsorption process and a regeneration process, and manufactures product oxygen continuously as everyone knows, For example, nitrogen in the raw material air introduced from the raw-material-air introducing pipe 12 is made to stick to adsorbent, such as zeolite, and is divided into nitrogen and oxygen, and the separated oxygen is derived to the product oxygen delivery tube 13.

[0011] For example, when one adsorption column 11a is in an adsorption process. The oxygen which the raw material air introduced through the raw-material-air introducing pipe 12 from the compressor which is not illustrated was introduced in the adsorption column 11a, and separated from the inlet valve 14a by the side of the adsorption column 11a is drawn from the outlet valve 15a through the product oxygen delivery tube 13 by the buffer tank 16 for oxygen. At this time, it is in a regeneration process, the nitrogen which is sticking to the adsorbent in this adsorption column 11b is inhaled by the vacuum pump 18 through the regeneration valve 17b by the side of the adsorption column 11b, and the adsorption column 11b of another side is drawn through the desorption nitrogen delivery tube 19 by the buffer tank 20 for nitrogen.

[0012] After the adsorption process of the above-mentioned adsorption column 11a and the regeneration process of the adsorption column 11b are completed, The inlet valves 14a and 14b, the outlet valves 15a and 15b, the regeneration valves 17a and 17b, The outlet side communicating valve 21 switches, and is opened and closed, the adsorption column 11a goes into a regeneration process, the adsorption column 11b goes into an adsorption process, and while said each valve switches in the given order, is opened and closed and both the pipes 11a and 11b are hereafter switched to an adsorption process and a regeneration process, oxygen and nitrogen are separated continuously.

[0013] Thus, the oxygen stored in the buffer tank 16 for oxygen is introduced into the burner 2 via the oxygen lead pipe 3 and the valve 4, and the nitrogen stored in the buffer tank 20 for nitrogen is introduced into the exhaust gas discharge part of the semiconductor manufacturing device 1 as nitrogen for dilution via the nitrogen lead pipe 5 and the valve 6.

[0014]Although there is a stage when the oxygen which remains in a pipe is drawn through the regeneration valves 17a and 17b at the time of reproduction of the adsorption columns 11a and 11b, As for oxygen being contained in the above-mentioned nitrogen for dilution, since it is not desirable, it is desirable to emit oxygen content nitrogen to the atmosphere from the discharge tube which is not illustrated at the stage when oxygen is drawn.

[0015]Thus, while introducing into the burner 2 by making combustion the product oxygen obtained from this oxygen PSA10 by attaching oxygen PSA10 to a combustion eliminating unit, the nitrogen currently emitted as exhaust gas (*****) can usually be effectively used as nitrogen for dilution. When the nitrogen for dilution obtained from oxygen PSA10 runs short, as shown in a figure, can establish the nitrogen introduction means 7 independently, or when oxygen for combustion runs short, can establish an oxygen introduction means independently, but. Even in this case, it is possible to reduce the amount of consumption of these nitrogen and oxygen substantially.

[0016]What is necessary is to have been able to acquire the same effect, even if it used the nitrogen PSA which extracts nitrogen as a product from raw material air, to have accepted the initial complement of nitrogen and oxygen, etc., to shift, and just to use that PSA, although the oxygen PSA which extracts oxygen as a product was used in the above-mentioned example. The composition of PSA can be suitably selected according to a throughput etc., similarly, the composition of a semiconductor manufacturing device and a burner is arbitrary, and the thing of various composition of being used from the former can be used.

[0017]Although the direct inlet of the oxygen is carried out to the burner in the above-mentioned example, it is good to it also as oxygen enriched air to add oxygen to the air introduced into a burner.

[0018]

[Effect of the Invention]As explained above, the exhaust gas combustion damage elimination method and device of this invention, It introduces into a burner, after diluting with inactive gas the exhaust gas containing the inflammable detrimental constituent discharged from a semiconductor manufacturing device, Since nitrogen for dilution and oxygen for combustion were obtained from the pressure fluctuation type adsorption separation device (PSA) which separates oxygen and nitrogen in the air in adding oxygen for auxiliary combustion, having burned it, and decomposing and detoxicating an inflammable detrimental constituent, Oxygen which is a product of PSA, or not only nitrogen but ***** or exhaust oxygen discharged conventionally can be used effectively, and it becomes possible to perform efficiently combustion damage elimination of the above-mentioned exhaust gas by low cost moreover.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a distribution diagram showing one example of this invention.

[Description of Notations]

1 [-- A nitrogen lead pipe, 10 / -- The oxygen PSA, 11a, 11b / -- An adsorption column, 12 / -- A raw-material-air introducing pipe, 13 / -- A product oxygen delivery tube, 19 / -- Desorption nitrogen delivery tube] -- A semiconductor manufacturing device, 2 -- A burner, 3 -- An oxygen lead pipe, 5

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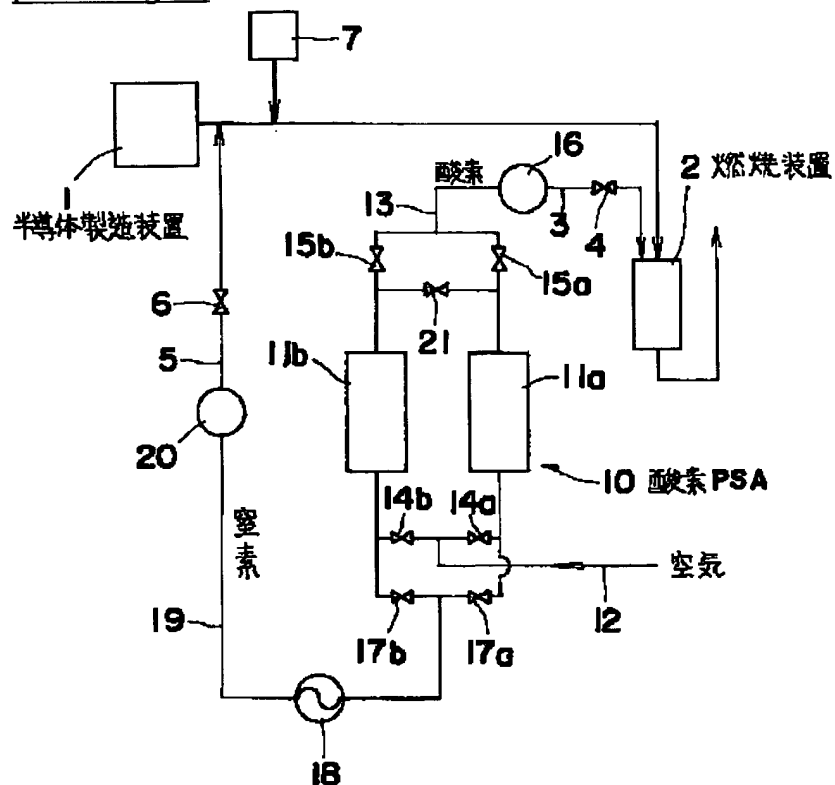
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DRAWINGS

[Drawing 1]



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